Lessons Learned from Three Watershed-Sensitive Development Demonstration Projects in the Great Lakes Basin

Sarah Bennett Nerenberg
The Conservation Fund
Great Lakes Office
Chicago, Illinois

Introduction to The Conservation Fund

The Conservation Fund (TCF) is a national, non-profit conservation organization that purchases and protects land – more than 1.6 million acres since 1985. TCF also assists local communities, private landowners and government agencies with programs that balance conservation with economicdevelopment. TCF works with communities to improve water quality, build sustainable economic opportunities, and develop leadership skills, activities that put it at the forefront of conservation across America.

TCF has been active in the Great Lakes Basin since it opened a regional office in 1995. The initial focus of its work was the Great Lakes Watershed Initiative. This basin-wide effort was designed to raise the local visibility of the nonpoint source water pollution issue. The Initiative adapted many of the innovative solutions showcased in the National Forum on Nonpoint Source Pollution. TCF worked with many local partners to launch a network of community-based projects addressing nonpoint source water pollution in urban and rapidly urbanizing areas in eight states and Canada. The Initiative was conducted in partnership with the Council of Great Lakes Governors with major funding from the Great Lakes Protection Fund and Kraft Foods.

TCF expanded several projects as an outgrowth of the Initiative including the watershed-sensitive development work outlined in this paper and a sustainable development effort in Michigan. In Michigan, TCF facilitates a broad, community-based sustainable development effort in the Saginaw Bay watershed. The goal of the initiative, which engages local businesses, community groups, and government agencies, is to better link the environmental and economic well being of Saginaw Bay communities in order to sustain and improve the region's overall quality of life. This year, the project received the National Award for Sustainability from the President's Council for Sustainable Development and Renew America.

Introduction to Conservation Development Project

Currently, TCF is targeting one of the remaining threats to natural resource quality, enhancement, and preservation in urbanizing areas – conventionally designed subdivisions. In partnership with local developers, community groups, and government agencies, TCF is working in the Great Lakes Basin on the Conservation Development project. This project is designed to demonstrate the environmental and economic benefits of watershed-sensitive design through a series of model developments. In particular, we are working to demonstrate the benefits of watershed-sensitive site-planning and best management practices that reduce impervious cover and conserve open space. The current model projects are being developed in Huron, OH, Germantown, WI, and Niles, MI. The George Gund Foundation and the Great Lakes Protection Fund have provided major funding for this project.

We define watershed-sensitive development to include: open space design, significant reduction in impervious coverage, natural stormwater conveyance and storage to the greatest extent possible, and appropriate construction mitigation measures. Watershed-sensitive design can be used to build the same number of houses and still preserve a significant portion of the subdivision's original landscape. These open spaces serve important community and environmental functions. Agricultural land can be farmed, residents can enjoy recreational and aesthetic benefits, and important natural areas and systems can be preserved. Alternative designs also reduce the amount of impervious cover.

Techniques including narrower streets, porous surface parking areas, stream buffers, and open channelsforstormwater conveyance minimize runoff from new development and its negative impacts on water resources.

When evaluating potential conservation development projects, The Fund considered the following criteria:

- Local community must be interested and open to new techniques, including flexibility on zoning and subdivision code issues;
- Property already slated for development and conventional development would have significant negative impacts on the site itself or adjacent natural resources;
- Project partners represent one of the dominant development paradigms in the Great Lakes (i.e., professional developer building homes in farm fields, lay developer seeking to hold and protect family or other special lands, government agency seeking to encourage sound practices); and
- Project site is suitable for demonstrating broad array of site design techniques and best management practices (BMPs).

Through TCF's work in the Great Lakes, we gathered many lessons-learned that may be applied to other regional and national efforts, This paper will review many of these lessons with the hope that other communities and organizations will be able to benefit from our experiences. The paper is organized into the four sections listed below:

I. Overall Lessons Learned

1. Not "One Size Fits All"
2. Measurable Criteria for Watershed-Sensitive Development
3. Adequate Oversight and Inspection
4. Incentive System Needed
5. Relationship to Other Smart Growth Movements

II. Lessons Learned about the Development Process

1. Pace of Development Often Incompatible with Innovative Site Design
2. A Greater Initial Investment in the Baseline Information is Necessary
3. Initial Cost of Watershed-Sensitive Developments
4. Deed Restrictions
5. Need Additional Lay Developer Education
6. Aesthetics Do Not Equal Ecology

III. Lessons Learned about Engineering/Site Design

1. Educate the Engineers
2. Lot Size Often Dictated by Septic Issues
3. Need Hard Science

IV. Lessons Learned about Working with Communities

1. Community Initiative

2. Local Official Knowledge Varied

3. Strong Local Partner is Key

4. Final Lessons Learned

Overall Lessons Learned

Not "One Size Fits All"

The approach used to create a watershed sensitive development must be tailored to the individual, organization, or developer creating it. The assistance needed by a private landowner that is seeking to preserve portions of family lands, for example, is quite different from that needed by a professional developer. We found that the models we developed need to take the different skills and goals of the project's initiator into account very early in the process. For example:

Lay developers (i.e., the individual landowners), not surprisingly, need help with the business aspects of the project, and are more inclined to make frequent changes to the preliminary site plan and architectural style of the development. These changes often reflect something the developer has "just learned" or "just considered." These new ideas can add value to the project, but they also require the technical assistants (e.g., landscape architects and engineers) to be more patient, more flexible, and firmer than they might be with professional developers.

Professional developers demand immediate turnaround on requests for assistance, and are looking for "the facts" on what is required to make a development watershed-sensitive. They can be somewhat impatient with the notion that there are not a fixed and specified set of best management practices and site design practices that, if employed, will "always" result in an "environmentally friendly" development.

Measurable Criteria for Watershed-Sensitive Development

As we began to design the model projects, it became apparent that there were no specific criteria available to measure the benefits of the watershed-sensitive design. A tool was needed to encourage developers to fashion environmentally friendly site designs, to help communities add flexibility to their local ordinances, and to provide a standard that can be understood by both homebuyers and existing community residents.

In response to this, TCF developed the Conservation Development Evaluation System (CeDES) as a rating system to evaluate a conservation development over the development's lifetime with emphasis on water quality and landscape impacts. The purpose of CeDES is to encourage developers to think about environmental concerns earlier in the planning process and to provide consumers and communities with a means of assessing the impact of better site design practices. It was developed with input from over thirty national professionals skilled in planning and evaluating conservation developments. It may be viewed at http://www.conservationfund.org/conservation/sustain/gloindex.html.

Adequate Oversight and Inspection

One of the biggest challenges is ensuring that the contractors are building in an environmentally responsible manner. Even if the developer is committed to minimizing the impact of the development on the environment, if contractors are not educated and committed it may not happen. This is a challenge for many local agencies and municipalities who have limited staff for constant inspections. Even if the communities have ordinances that require construction erosion controls etc., without constant inspection many contractors do not follow the requirements. The nonpoint source pollution from construction, especially the sediment loadings, can negate any benefits from the alternative site design. One recommendation is for the community to require that an environmental inspector be hired specifically for the site. The inspector may be from a consulting firm or from a local Soil and Water Conservation District.

Incentive System Needed

We expect that this process will proceed much more quickly in communities that have recognized the threats conventional developments pose and have begun developing strategies to address them. In order to expand conservation development practices to a broader constituency, state or county agencies may need to develop incentive programs that prompt local developers to undertake these projects. With each community, we encouraged the creation of incentives for watershed-sensitive development. These included density bonuses for the developer through credits for land preservation and minimization of impervious coverage. We also investigated the use of the Clean Water Act State Revolving Fund (SRF). Among other uses, these funds are used to reduce nonpoint source pollution and could encourage watershed-sensitive development. The State of Ohio has successfully used the SRF for this purpose and we hope to pilot the same use of the SRF loans in other states. Incentives such as Ohio's loan program, coupled with the higher financial returns these developments are expected to generate, are making watershed sensitive developments more the norm in the Great Lakes Basin.

Relationship to Other Smart Growth Movements

There are many "Smart Growth" movements currently being debating and promoted throughout the country. Watershed-sensitive development is just one part of the equation. At times, we were challenged to show how this fits into overall community sustainability efforts. The work that the National Site Planning Roundtable completed to develop "Better Site Design" principles has been invaluable in demonstrating how these different movement can work together (Center for Watershed Protection, 1998). We often say that watershed-sensitive development is one option for Smart Growth but that a community needs to find the correct planning principles to work for their residents and issues. Those in the Traditional Neighborhood Design (TND) movement challenge putting sidewalks only on one side of the street, which we recommend for reducing impervious coverage. We also suggest that if sidewalks are on both sides of the street at least one should be made of pervious materials. There also are environmental groups that challenge us for encouraging greenfield development instead of infill development. Again, watershed-sensitive development is only one option of many and if the market is going to demand suburban fringe growth, at least we can work with the communities and developers to ensure that it is done with maximum possible protection and enhancement of the natural resources.

Lessons Learned about the Development Process

Pace of Development Often Incompatible with Innovative Site Design

The pace of development and the pace of government decision-making often are absolutely incompatible. Developers with outstanding loans on land need to move quickly to ensure a development is economically viable. Government agencies, on the other hand, are very concerned about the impacts of development, but move very cautiously, especially when they are undertaking something new. The result is that it is easier for both government and developer to create conventional, environmentally harmful developments than to do something better.

On the demonstration projects, TCF took special care at the outset of the process to communicate the timelines of each participant to the other. In this way, we hoped to keep the parties from throwing up their hands and giving up. For the region, however, we explored possibilities to get communities to adopt "fast track" approvals for watershed-sensitive communities. The first need is to show municipal authorities that these developments deliver tangible benefits, then we can help them develop mechanisms such as a streamlined review process and updated subdivision and zoning ordinances that encourage their creation.

A Greater Initial Investment in the Baseline Information is Necessary

Before planning a watershed-sensitive development, fairly detailed baseline information including topography, soils, and wetlands delineations is needed. Although developers hope that they get enough of the baseline site information before beginning design work, inevitably the risk/benefit of doing extensive baseline work (e.g., soil borings) may preclude the developer from getting all of the necessary baseline data. The common practice is to use "engineering

judgment" based on existing data and extrapolation to the rest of the site. Unfortunately, especially when the drainage plan is an integral part of the initial site design, relying on "engineering judgment" simply is not sufficient. For example, on the Ohio site we relied on the existing soils information to design the swale system. After presenting a preliminary site plan, the developer discovered through additional research and sampling that the available soil information did not accurately represent the existing soil conditions and the drainage plan had to be reconstructed.

Initial Cost of Watershed-Sensitive Developments

Planning and developing a watershed-sensitive development takes time and costs money. Both lay and professional developers often underestimate these initial costs. Professional developers often leave site planning to their engineers. The engineers typically obtain a wetlands delineation and examine soil and topography maps, but do not evaluate the site from a watershed or ecological perspective. Although lay developers may be more familiar with the special features of their properties than professional developers, both need help to catalog all the features and to understand the site's role in the surrounding landscape. Quite reasonably, professional developers often are unwilling to undertake these expenses until they have a sense of the project's scale and niche in the market. We believe, and existing watershed-sensitive developments indicate, that the costs of evaluating a property from an ecological and a watershed perspective will be recovered when the development is sold out.

Deed Restrictions

The deed restrictions (i.e., covenants, conditions, and restrictions) necessary to ensure that the development will continue as a watershed-sensitive development in perpetuity are a lot more extensive than typical deed restrictions. Early in the process, sample restrictions for various developments should be presented to the developer and to the community so that they understand the consequences of using some of the watershed sensitive techniques. The developer will gain an appreciation for the long-term commitment necessary for a successful development and local officials may be put at ease when they recognize that major additional responsibilities (e.g., swale maintenance) rest with the homeowners association and not the local government.

Need Additional Lay Developer Education

Private landowners need to be assisted and educated through the process. Although these initiators often have a deeper environmental commitment than professional developers, they often do not understand what kinds of activities on their properties will have negative watershed impacts. For example, on one of our projects, the lay developer suggested that a pond be built each time an area of low-lying ground is found to be wet most of the year. Once informed about the relationship of these areas to more prominent wetlands on the site, the developer agreed to treat these areas more appropriately (i.e., preserving and enhancing the existing wetlands). The professional developers understand stormwater and wetlands issues better because they operate in the regulatory arena. The lay developers may need to be educated about the significance of these issues and other issues that are common knowledge to professional developers.

Aesthetics Do Not Equal Ecology

Another aspect of landowner education is the principle that aesthetics do not equal ecology. Just because a development preserves or creates attractive green spaces does not necessarily indicate that it is not harmful to the surrounding watershed. Accordingly, the criteria we developed for watershed-sensitive development (see discussion above under Measurable Criteria) incorporate appropriate baseline evaluation of the site to insure key resources are protected, and a thorough analysis of the stormwater impacts after development.

Lessons Learned about Engineering/Site Design

Educate the Engineers

If any of the county, township, or city engineers are not comfortable with the techniques being used, they can turn down the project at any point in the review process. In all three of our projects, the "old-timer-" engineers were extremely conservative and feared change more than any other local officials. We found that the developers' engineers need constant oversight and education to design the sites using the watershed-sensitive techniques. Unfortunately, without a broad effort to educate engineers, they will have to be educated one community or county at a time. Once these techniques become more commonplace, we assume that such a great initial effort will not be necessary.

Lot Size Often Dictated by Septic Issues

Wastewaterissuesoften control the form, location, and economicfeasibilityof a new residential subdivision. In many parts of the Great Lakes region, heavy clay soils strictly limit the functioning of conventional septic systems. For this reason, lot size is frequently dictated by septic issues as much as by local zoning. Although there are some alternate systems (e.g., constructed wetlands and community systems) being piloted and used in the region, local health officials are very cautious about permitting them. This caution arises both from concerns about their technical functioning and about long term maintenance issues. Communities already feel burdened by the need to monitor individual septic systems. They are skeptical about a homeowner association's ability to reliably maintain a community treatment system.

Wastewater treatment issues should be considered up front in evaluating the feasibility of clustering homes on a particular site. If a public sewer does not serve the site, clustering probably will not work as well (i.e., the individual lot sizes will not be able to be reduced as much). There is the possibility of placing the leach fields in the common property to increase the overall open space percentage.

Need Hard Science

Although there is a great deal of national literature detailing watershed-sensitive development techniques, there is not a lot of research documenting the extent of the water quality benefits they provide in the field. The Center for Watershed Protection (CWP) recognizes that there is a lack of water quality monitoring data that evaluates the techniques in varied site conditions and is working to develop and encourage more studies. Through consultation with the CWP, the Northeastern Illinois Planning Commission, and the Wisconsin Department of Natural Resources (WDNR), we found that funding for long-term monitoring of these techniques is scarce. Without this data, many of these techniques may be challenged successfully by skeptical local officials. With the assistance of Old Woman Creek Estuarine Research Reserve, one of our local partners, we are monitoring the water quality at the Ohio site. We hope that they will be able to continue the monitoring after our grants are over. We also are working with the WDNR to secure funding for long-term water quality monitoring at the Germantown site. It is our hope that this information will continue to back up many of the claims of watershed-sensitive development and that funding will continue to support these efforts.

Lessons Learned about Working with Communities

Community Initiative

Without community buy-in and interest in these concepts, even the most enlightened developer is not going to be able to get a project approved. When we first started this project, we thought that the developers were going to be the "hard sell." In two out of three of the communities, it actually has been the communities that needed more education. In the Huron project, the developer was sold on many of the alternative site design techniques until he kept getting negative feedback from the township board. This site was chosen because of the commitment of the developer and the obvious benefits to the surrounding water resources. What was not realized was how much resistance there would be in the political arena. At this project, we had several informal meetings with local officials prior to presenting a conceptual plan, but because the process was developer-initiated, they continued to be resistant throughout the process.

Local Official Knowledge Varied

Municipal, county, and state officials with similar regulatory responsibilities often have very different views about the appropriateness of new techniques. Although there are no hard and fast rules about who is likely to be more progressive, disagreements are common and a primary cause of frustration among developers.

As development is now regulated, it is more expensive and time-consuming for a lay or professional developer to create a watershed-sensitive development. The only way for a developer to address this situation is to inform local regulators and planning officials about the project early on, and to involve them in the process Unfortunately, this involvement will probably not speed up the process for the individual developer, but after a few such projects are launched, we believe the barriers for these kinds of developments will be lowered.

Getting everyone with a regulatory or permitting role on a project involved at the very beginning is absolutely vital. If a project that includes techniques that have not been implemented in the region before gets too far along before all the regulators and municipal officials are brought in, the "stranger to the deal" can feel left out and derail the project. Much of this problem will be allayed once a few watershed-sensitive developments are built, but until then, developers and regulators pushing for these practices need to make special efforts to get everyone to the table early. Of course, this process increases the costs of doing the development initially, but it can keep it from falling apart after significant site planning and related costs are incurred.

Strong Local Partner is Key

Throughout this project, TCF acted as a facilitator between the communities and developers and as a representative of the silent third party, the environment. We believe that as each community begins to look at this type of development, this third party is key to the success of a project. Although there are many merits to approaching communities as a national organization, without a primary local partner who is well-versed in the trials and tribulations of the development process (or willing to learn them), it is difficult to proceed. A preferable arrangement would be a local organization, such as a land trust, leading the effort with support from a regional or national organization or technical assistance center. A local organization will have a greater vested interest in and knowledge of the local environment, will know the local officials and political and personal histories, and will be able to track and monitor the day-to-day activities surrounding the development. In the long term, local land trusts may become a key player in this area. They understand land conservation and watershed issues, frequently have close ties with both local landowners and local government officials, and have some comprehension of the development industry.

Final Lessons Learned

Several realities of the development process that have little to do with the challenges of watershed-sensitive development are important to mention for groups and communities considering this type of project. One is that the personalities and reputations of the developers can make or break a project. On our project in Ohio, the developer apparently had a "history" with several of the plan commissioners. Our partners in the community think that the plan commission and the engineers were being unduly unfair during the review process. Also, one of the developers in Wisconsin has a reputation for "low-end" development. Because of this reputation, the Village is afraid that the developers will do their typical development in their town.

Another reality of the development process is that the Village Planner of Germantown estimated that 60% of submitted development plans are reviewed by the plan commission and less than 50% of zoning requests are approved. All of our projects include a zoning request because the current local ordinances do not include a provision for watershed-sensitive development.

Conclusion

At all three of our model sites there are already signs of new developments being proposed with many of the watershed-sensitive techniques. In Wisconsin, the developer was approached by neighboring communities to design

similar subdivisions. In Michigan, several local officials have stated interest in adding language in their new ordinances that would encourage this type of development. In Ohio, our local agency partner, Old Woman Creek National Estuarine Reserve, was approached by a developer who has been watching the process and is interested in using some of the techniques at an adjacent site. While the review processes for all three projects have not been as easy as anticipated, it is expected that the next round of developments will have an easier time because of the trailblazing work done before them.

References

Arendt, Randall. 1997. Conservation Subdivision Design. Natural Lands Trust, Media, PA.

Center for Watershed Protection (CWP). 1998. Better Site Design: *A Handbook for Changing Development Rules in Your* Community. Prepared for the Site Planning Roundtable, CWP, Ellicott City, Maryland.

Center for Watershed Protection (CWP). 1998. Consensus *Agreementon Model Development Principles* to *Protect Our* Streams, *Lakes,* and *Wetlands.* Prepared by the Site Planning Roundtable, CWP, Ellicott City, MD.